

REMARKS

In view of the above amendments and the following remarks, reconsideration of the rejections contained in the Office Action of December 7, 2010 is respectfully requested.

By this Amendment, claims 73 and 79 have been amended, and claims 87 and 88 have been cancelled. Thus, claims 73-86 are currently pending in the application. No new matter has been added by these amendments. In particular, it is noted that the amendments to claims 73 and 79 are supported at least by page 13 of the original specification.

On page 2 of the Office Action, the Examiner rejected claims 73 and 79 under 35 U.S.C. § 112, second paragraph, as being indefinite. In particular, the Examiner asserts that the phrase “shrinking by about 10%” renders the claims indefinite because it is unclear whether the shrinkage of 10% refers to a shrinkage in volume, length, weight, etc. In this regard, it is noted that claims 73 and 79 have been amended to recite that the masking pins shrink by about 10% “in volume.” Accordingly, it is respectfully submitted that the Examiner’s § 112 rejection is not applicable to amended claims 73 and 79.

Further, the Examiner rejected claims 87 and 88 under 35 U.S.C. § 112, second paragraph, as being indefinite. Without acquiescing to the Examiner’s assertion that claims 87 and 88 are indefinite, it is noted that claims 87 and 88 have been cancelled. Thus, it is respectfully submitted that the Examiner’s § 112 rejection of claims 87 and 88 is rendered moot.

On pages 5-13 of the Office Action, the Examiner rejected claims 73-84 and 87-88 under 35 U.S.C. § 103(a) as being unpatentable over Clingman et al. (US 5,130,163), as evidenced by “GE Silicones RTV 11” Data Sheet (hereinafter RTV 11 Sheet), and in view of Kang et al. (US 5,800,695), Montierth (US 4,411,856), Watkins (US 4,634,623) and the admitted state of the prior art. On pages 13-14 of the Office Action, the Examiner rejected claims 85-86 under 35 U.S.C. § 103(a) as being unpatentable over Clingman, as evidenced by RTV 11 Sheet, in view of Kang, Montierth, Watkins and the admitted state of the prior art, and further in view of Emer (US 6,380,512). For the reasons discussed below, it is respectfully submitted that the amended claims are clearly patentable over the prior art of record.

Amended independent claims 73 and 79 each recite a method of forming a thermal barrier coating on a surface of a component having cooling holes, which includes forming masking pins in the cooling holes by injecting a liquid elastic body into each of the cooling holes, and by thereafter hardening the liquid elastic body in the cooling holes. The methods of

claims 73 and 79 also include forming the thermal barrier coating on the surface of the component by spray coating after the forming of the masking pins. Further, claims 73 and 79 recite that an injection amount of the liquid elastic body is adjusted so that a surface of the elastic body injected into each of the cooling holes protrudes above the surface of the component when the liquid elastic body is injected into the cooling holes, and so that the masking pins *after hardening and shrinking by about 10% in volume* do not protrude above the surface of the component.

In this regard, it is noted that the shrinking of the masking pins “by about 10% in volume” is critical because the resulting masking pin does not protrude above the internal periphery of the component, which allows the thermal barrier to be coated on the entire inner surface, as discussed on page 16 of the original specification. Thus, if the shrinkage of the masking pin is less than 10% in volume, the resulting masking pin may protrude above the surface of the component and prevent the thermal barrier from being formed on a portion of the surface. Conversely, if the shrinkage of the masking pin is more than 10% in volume, the resulting masking pin may be excessively recessed with respect to the surface of the component.

Clingman discloses a coating method which, as shown in Figs. 2-4, includes maskant plugs 30 being formed in side perforations 22 of an inside lamina 12. However, as noted by the Examiner on page 5 of the Office Action, Clingman does not disclose *injecting a liquid elastic body into each of the cooling holes, and that an injection amount of the liquid elastic body is adjusted so that a surface of the elastic body injected into each of the cooling holes protrudes above the surface of the component when the liquid elastic body is injected into the cooling holes, and so that the masking pins after hardening and shrinking by about 10% in volume do not protrude above the surface of the component*, as required by independent claims 73 and 79.

In this regard, on page 6 of the Office Action, the Examiner notes that Clingman discloses the use of RTV-11 as a silicone rubber that is used to make the masking plugs 30. Further, the Examiner cites the RTV-11 Sheet as disclosing that one of ordinary skill in the art would recognize that the silicone rubber of Clingman is an easily pourable liquid having a shrinkage of 0.6%. The Examiner also acknowledges on page 6 of the Office Action that Clingman as modified by the RTV-11 Sheet does not disclose injecting a liquid elastic body into each of the cooling holes, and that *an injection amount of the liquid elastic body is adjusted so that a surface of the elastic body injected into each of the cooling holes protrudes above the*

surface of the component when the liquid elastic body is injected into the cooling holes, and so that the masking pins after hardening and shrinking by about 10% in volume do not protrude above the surface of the component, as required by independent claims 73 and 79.

In this regard, the Examiner cites Kang as disclosing a maskant which is injected into cooling holes as a liquid and is then cured, and that the maskant is filled into the cooling holes so as to be flush with the surface of the component, and therefore concludes that it would have been obvious to one of ordinary skill in the art to modify Clingman by injecting the maskant in a liquid state into the cooling holes such that, taking into account any shrinkage of the maskant upon hardening, the cured maskant is flush with the surface of the component.

Further, the Examiner also cites Montierth as disclosing that care should be taken to account for any shrinkage which occurs when forming a mask by injection molding, and discloses examples of total shrinkage between 2.7 and 4.6 volume %.

In addition, the Examiner cites Watkins as disclosing that silicone elastomer polymers undergo linear shrinkage of at least 3% and more preferably at least 6% during curing. In this regard, the Examiner indicates that it would have been obvious to one of ordinary skill in the art to modify Clingman, as evidenced by RTV-11 Sheet, to inject the maskant in a liquid state as suggested by Kang, and to adjust an amount of the maskant so that the masking pins after hardening and shrinking by about 10% do not protrude above the surface of the component as suggested by Montierth and Watkins.

However, it is noted that Clingman, the RTV-11 Sheet and Kang do not disclose that an injection amount of the liquid elastic body is adjusted so that a surface of the elastic body injected into each of the cooling holes protrudes above the surface of the component when the liquid elastic body is injected into the cooling holes, and so that the masking pins *after hardening and shrinking by about 10% in volume do not protrude above the surface of the component*, as required by independent claims 73 and 79. Rather, Clingman and Kang do not disclose a specific shrinkage amount of the maskant, and the RTV-11 Sheet only discloses a shrinkage of 0.6%, and therefore none of the Clingman reference, the Kang reference and the RTV-11 Sheet disclose that an injection amount of the liquid elastic body is adjusted so that a surface of the elastic body injected into each of the cooling holes protrudes above the surface of the component when the liquid elastic body is injected into the cooling holes, and so that the masking pins after

hardening and shrinking by about 10% in volume do not protrude above the surface of the component, as required by independent claims 73 and 79.

Further, it is noted that the Montierth reference and Watkins reference do not disclose that an injection amount of the liquid elastic body is adjusted so that the masking pins after hardening and shrinking by about 10% in volume do not protrude above the surface of the component, as required by independent claims 73 and 79. Rather, Montierth only discloses total shrinkage of 2.7-4.6 volume %, and Watkins only discloses linear shrinkage of at least 3% (and more preferably at least 6%), and thus none of the Montierth and Watkins references discloses that the masking pins after hardening and shrinking by about 10% in volume do not protrude above the surface of the component, as required by independent claims 73 and 79.

Accordingly, as none of the Clingman, RTV-11 Sheet, Kang, Montierth and Watkins references and the admitted state of the prior art discloses that an injection amount of the liquid elastic body is adjusted so that a surface of the elastic body injected into each of the cooling holes protrudes above the surface of the component when the liquid elastic body is injected into the cooling holes, and so that the masking pins *after hardening and shrinking by about 10% in volume do not protrude above the surface of the component*, as required by independent claims 73 and 79, it is respectfully submitted that the combination of the Clingman, RTV-11 Sheet, Kang, Montierth and Watkins references and the admitted state of the prior art does not disclose or suggest all of the limitations of independent claims 73 and 79.

Therefore, for the reasons presented above, it is believed apparent that the present invention as recited in independent claims 73 and 79 is not disclosed or suggested by the Clingman reference, the RTV 11 Sheet, the Kang reference, the Montierth reference, the Watkins reference and the admitted state of the prior art taken either individually or in combination. Accordingly, a person having ordinary skill in the art would clearly not have modified the Clingman reference in view of the RTV 11 Sheet, the Kang reference, the Montierth reference, the Watkins reference and the admitted state of the prior art in such a manner as to result in or otherwise render obvious the present invention of independent claims 73 and 79.

Further, it is respectfully submitted that the Emer reference does not cure the defects of the Clingman, RTV-11 Sheet, Kang, Montierth and Watkins references as discussed above.

Therefore, it is respectfully submitted that independent claims 73 and 79, as well as claims 74-78 and 80-86 which depend therefrom, are clearly allowable over the prior art of

record.

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is clearly in condition for allowance. An early notice to that effect is respectfully solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, the Examiner is respectfully requested to contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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